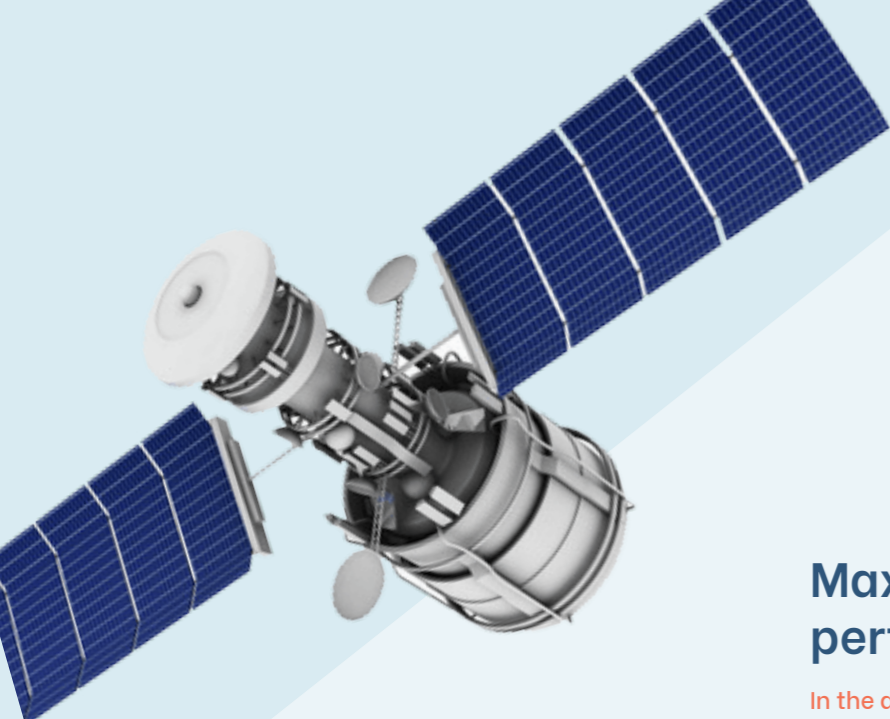


Aerospace-Grade Shock Attenuators

LAUNCH WITH CONFIDENCE, SECURE SEPARATION





Maximize your mission's performance and reliability

In the dynamic world of aerospace engineering, precision and reliability are non-negotiable. That's why industry professionals trust in the uncompromising quality and reliability of Metravib Aerospace-Grade Shock Attenuators.

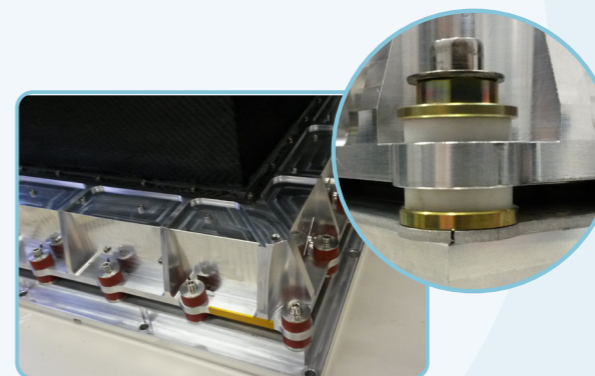
During critical launch phases, the separation of stages and the launcher's fairing introduces highly energetic shock waves, posing a threat to onboard equipment. These shock waves, generated by the activation of pyrotechnic cut systems, propagate rapidly, jeopardizing mission-critical electronics. Consequently, equipment close to a cut zone can undergo severe damages, including local destructions, malfunctions, and significant performance reduction, jeopardizing the satellite mission. Engineered with meticulous detail, Metravib's attenuators provide a crucial defense, ensuring the integrity and functionality of onboard equipment.

Crafted with advanced elastomer bushes, our shock attenuators surpass industry standards, complying with stringent technical specifications set by satellite manufacturers. With a focus on cutting-edge materials and innovative damping mechanisms, they absorb and dissipate shock energy with unparalleled efficiency.



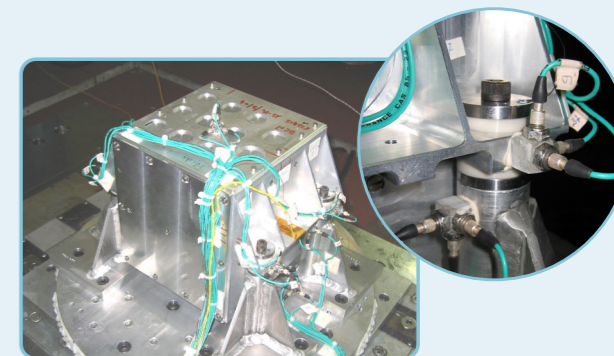
“Metravib has delivered over 5000 attenuators for launchers and approximately 600 units for satellites, showcasing our commitment to aerospace excellence.”

Built for mission-critical challenges



Interfaces and mass adaptation

- Metravib's attenuators are engineered to excel in space applications, offering superior shock attenuation capabilities.
- They are designed with adaptability in mind, allowing them to accommodate various effective masses and interface constraints seamlessly.



Shock attenuation

- Achieve significant attenuation levels ranging from 10 to 20dB in high-frequency (HF) ranges.

Environment characteristics

- Metravib's attenuators undergo rigorous testing to meet the demands of harsh aerospace environments.
- Silicone elastomers are tested for outgassing according to ECSS-Q-70-02 standards, with results slightly exceeding standard limit values.

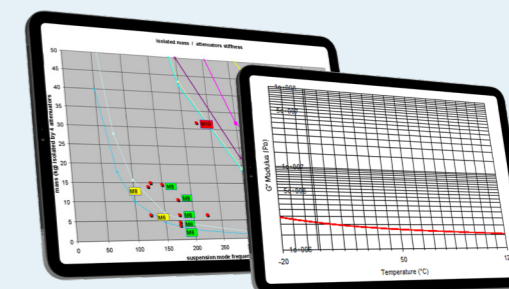
	TML	RML	CVCM
Specified	/	< 1%	0.1%
Measured	(1.03 % -> 1.66 %)	(1.00 % -> 1.63 %)	(0.25 % -> 0.31 %)

Quasi-Static Strength

- Each attenuator exhibits high strength, capable of withstanding forces ranging from 1500N up to 5800N, depending on the reference.

Stable Modulus

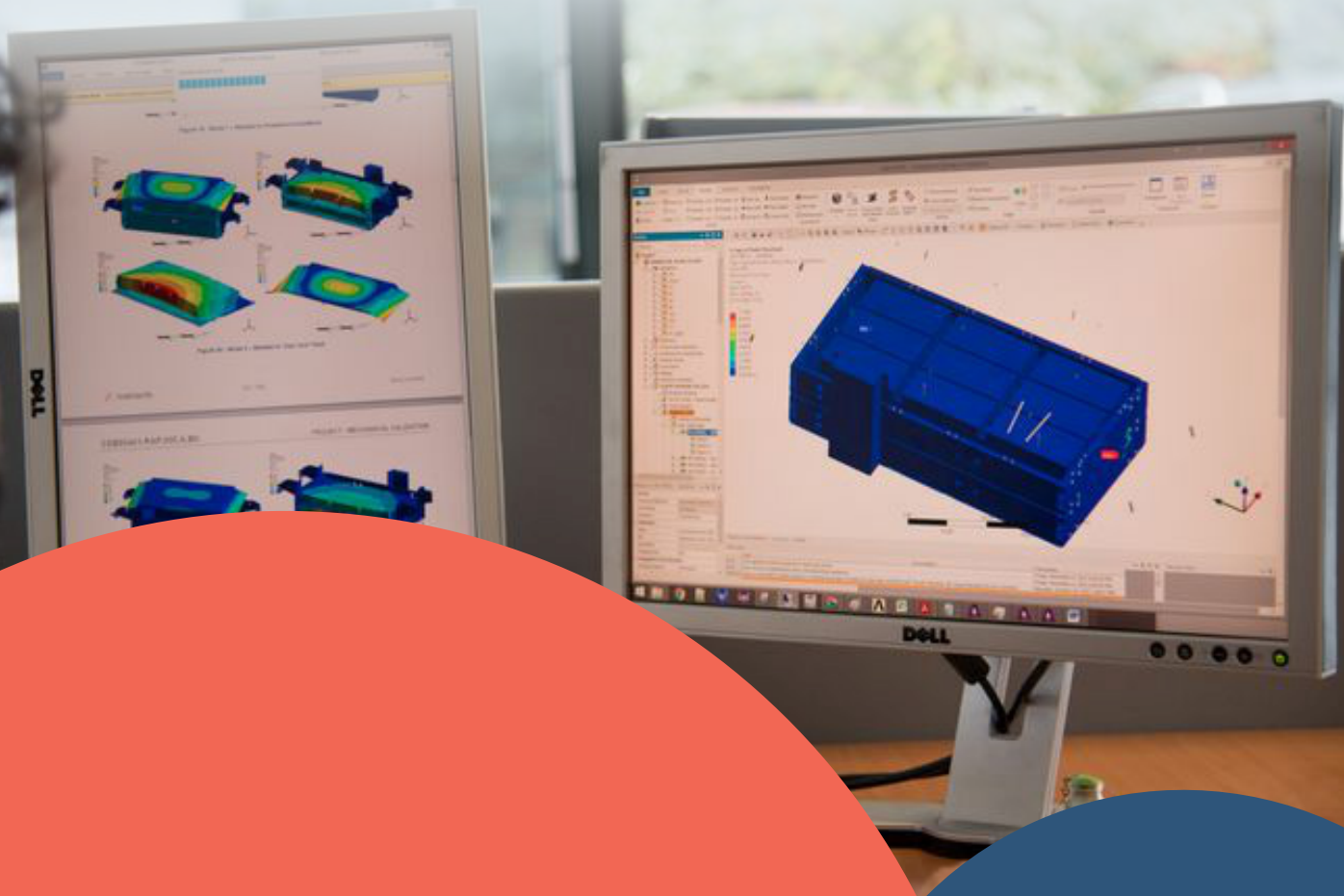
- Attenuators maintain a stable modulus across a wide temperature range, ensuring consistent performance under varying conditions.



Vibration Tests

- Attenuators endure vibration tests in combination with extreme temperature environments, up to 70°C.
- Random vibration levels exceed 0.2 g²/Hz at temperatures above 35°C (for select references).

More than 60 expert engineers in Vibration and Acoustic Engineering



The Metravib Advantage


Since 1969, Metravib Engineering has prioritised product design and solutions research, supporting industrial clients, engineering firms, and laboratories in their pursuit of ever more reliable and high-performing products.

We place particular emphasis on assessing durability and optimising structures to reduce weight, directly addressing key issues related to optimal resource utilisation and contributing to environmental impact reduction.


We collaborate with our clients to help shape the world of tomorrow.



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